

CAPE COD WATERSHED

Assessment and 5-Year Action Plan



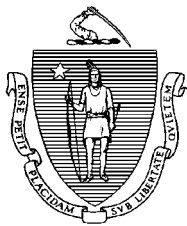
compiled by the
Former EOECA Cape Cod Watershed Team

edited by
Courtney Armentrout
Former Assistant Watershed Team Leader

2004



The Commonwealth of Massachusetts
Executive Office of Environmental Affairs



The Commonwealth of Massachusetts

Executive Office of Environmental Affairs

251 Causeway Street, Suite 900

Boston, MA 02114-2119

Mitt Romney
GOVERNOR

Kerry Healey
LIEUTENANT GOVERNOR

Ellen Roy Herzfelder
SECRETARY

Tel: (617) 626-1000

Fax: (617) 626-1181

or (617) 626-1180

<http://www.state.ma.us/envir>

November 19, 2004

Dear Friends of the Cape Cod Watershed:

It is with great pleasure that I present you with the 5-Year Watershed Action Plan for the Cape Cod Watershed. The plan will be used to guide local and state environmental efforts within the Cape Cod Watershed over the next five years. The plan expresses some of the overall goals of the Executive Office of Environmental Affairs, such as improving water quality, restoring natural flows to rivers, protecting and restoring biodiversity and habitats, improving public access and balanced resource use, improving local capacity, and promoting a shared responsibility for watershed protection and management.

The Cape Cod Watershed Action Plan was developed with input from the former Cape Cod Watershed Team and multiple stakeholders including watershed groups, state and federal agencies, Regional Planning Agencies and, of course, the general public from across the Watershed. We appreciate the opportunity to engage such a wide group of expertise and experience as it allows the state to focus on the issues and challenges that might otherwise not be easily characterized. From your input we have identified the following priorities:

- Clean Water
- Groundwater Protection
- Biodiversity and Healthy Ecosystems
- Community Preservation
- Watershed Stewardship

I commend everyone involved in this endeavor. Thank you for your dedication and expertise. If you are not currently a participant, I strongly encourage you to become active in the Cape Cod Watershed restoration and protection efforts.

Regards,

A handwritten signature in cursive script that reads "Ellen Roy Herzfelder".

Ellen Roy Herzfelder

Former Cape Cod Watershed Team

Members:

Massachusetts Executive Office of Environmental Affairs – Patti Kellogg, Watershed Team Leader and
Courtney Armentrout, Assistant Watershed Team Leader
Department of Environmental Protection – Elizabeth Kouloheras
Department of Environmental Management – Christine Gault, Les Perry
Department of Fisheries, Wildlife And Environmental Law Enforcement – Amy Singler, Steve Hurley
Division Of Marine Fisheries – Paul Caruso
Coastal Zone Management – Truman Henson, Katie Lund
Office Of Technical Assistance – Matt McCook
U.S. Environmental Protection Agency – Bruce Rosinoff
U.S.D.A. Natural Resources And Conservation Service – Don Liptack
Cape Cod National Seashore, National Park Service
Cape Cod Commission – Tom Cambareri, Ed Eichner
Barnstable County Coastal Resources Committee – Robert Duncanson
Orleans Water Quality Task Force – Judy Scanlon
Community Foundation of Cape Cod – Lisa McNeil
Association to Preserve Cape Cod – Maggie Geist
The Compact of Cape Cod Conservation Trusts – Mark Robinson

Other Participants:

Citizen Water Quality Monitoring Network
Pleasant Bay Alliance
Mashpee Environmental Coalition
Long Pond Association
Cotuit Waders
Three Bays Preservation
Bourne Water Pollution Task Force
Town of Barnstable
Town of Mashpee
Dennis Water Quality Advisory Board
Chatham Water Quality Lab
Harwich Water Quality Task Force
Barnstable County Resource Development Office
Orenda Wildlife Land Trust
Cape Cod Conservation District
Cape Cod Community College
Massachusetts Bays Program
Barnstable County Health Department
The Nature Conservancy
Massachusetts Audubon Society – Wellfleet Bay Wildlife Sanctuary
Coalition For Buzzards Bay
Cape & Islands Senior Environment Corps
Woods Hole Oceanographic Institute Sea Grant
United States Geological Survey
Massachusetts Wetlands Restoration Program
Town of Wellfleet
Town of Eastham
Indian Ponds Association
Brewster Ponds Stewards
And Many Interested Citizens

TABLE OF CONTENTS

Preamble	1
Purpose	1
Process	1
Structure	2
Reasoning Behind the Structure	2
Instructions for State Agency Use	3
Cape Cod Watershed Team Participants	3
Photo Credits	4
Cape Cod Watershed Assessment	5
Introduction	5
Section 1. Cape-wide Assessment	7
1.1 Physical Setting	7
1.2 Land Use	7
1.2.a. Local Comprehensive Plans	8
1.2.b. Buildout Analyses	8
1.2.c. Land Designations	9
1.2.d. Open Space Protection	10
1.2.e. Massachusetts Military Reservation	12
1.3 Water Resources	13
1.3.a. Surface Water	13
1.3.b. Groundwater	14
1.3.c. Water Quantity	16
1.3.d. Public Water Supplies	17
1.3.e. Water Supply Contaminants	18
1.3.f. Wastewater	19
1.3.g. Massachusetts Estuaries Project	20
1.3.h. Water Quality Monitoring	21
1.3.i. Impaired Waters	23
1.3.j. Fish Consumption Advisories	23
1.3.k. Beaches Act	24
1.3.l. MWRW Ocean Outfall	24
1.3.m. Discharge Permits	25
1.3.n. Stormwater	25
1.4 Coastal Issues	26
1.4.a. Shellfish Industry	26
1.4.b. Boating Impacts	27
1.4.c. Harbor Management Plans	27
1.4.d. Shoreline Change	28
1.4.e. Salt Marsh Assessments	28
1.4.f. Coastal Monitoring	28
1.4.g. Offshore Impacts	29

1.5	Habitat and Biodiversity	29
1.5.a.	Invasive Species	30
1.5.b.	Vernal Pools	30
1.5.c.	Protecting Significant Wildlife Habitat	31
1.6	Air Quality	32
1.7	Recreation Resources	33
1.7.a.	Public Access	33
1.7.b.	Walking Trails and Bike Paths	33
1.7.c.	Federal Lands – Cape Cod National Seashore	34
1.7.d.	State Forests and Parks	34
1.7.e.	DFW Wildlife Management Areas	37
1.7.f.	Massachusetts Audubon Society Sanctuaries	38
1.8	Socioeconomic Conditions.	38
1.8.a.	Population	38
1.8.b.	Social Conditions	39
1.8.c.	Economy	40
1.8.d.	Housing	41
1.8.e.	Traffic	41
	Conclusions	42
	References	43

Section 2. Subwatershed Fact Sheets and Maps 48

<u>Subwatershed</u>	<u>Town(s) Subwatershed Falls Within</u>
Allens Harbor	Harwich
Barnstable Harbor	Barnstable, Yarmouth, Sandwich
Bass River	Dennis, Yarmouth, Brewster
Boat Meadow River	Eastham, Orleans
Bournes Pond	Falmouth, Sandwich
Centerville River	Barnstable
Chase Garden Creek	Dennis, Yarmouth
Falmouth Inner Harbor	Falmouth
Great Pond	Falmouth, Sandwich
Great Sippewisset Creek	Falmouth
Green Pond	Falmouth, Sandwich
Herring River Eastham	Eastham
Herring River Harwich	Harwich, Brewster
Lewis Bay	Yarmouth, Barnstable
Little Pond	Falmouth
Little Sippewisset Creek	Falmouth
Megansett Harbor	Bourne, Falmouth
Mill Creek	Chatham, Harwich
Namskaket Creek	Brewster, Orleans
Nauset Marsh	Eastham, Orleans
Oyster Pond	Falmouth
Pamet River	Truro
Parker River	Yarmouth

Phinneys Harbor	Bourne, Sandwich
Pleasant Bay	Orleans, Chatham, Brewster, Harwich
Pocasset Harbor	Bourne, Sandwich
Pocasset River	Bourne, Sandwich
Popponesset Bay	Mashpee, Sandwich, Barnstable
Provincetown Harbor	Provincetown, Truro
Quissett Harbor	Falmouth
Quivett Creek	Brewster, Dennis
Rock Harbor Creek	Orleans, Eastham
Salt Pond	Falmouth
Sandwich Harbor	Sandwich
Saquatucket Harbor	Harwich
Scorton Creek	Sandwich
Sesuit Harbor	Dennis
Squaw Island	Barnstable
Stage Harbor	Chatham
Sulphur Springs	Chatham
Swan Pond River	Dennis, Harwich
Three Bay System	Barnstable, Sandwich
Waquoit Bay	Mashpee, Falmouth, Sandwich
Wellfleet Bay	Wellfleet, Eastham, Truro
West Falmouth Harbor	Falmouth
Wild Harbor	Falmouth, Bourne, Sandwich
Wychmere Harbor	Harwich

Cape Cod Watershed Five Year Action Plan

Section 1. Goals, Objectives, and Strategies	Action p. 1
Section 2. Action Plan Implementation Matrix	Matrix p. 1

Partner Reports

- 1998 Cape Cod Watershed, Draft Water Quality Assessment Report
Massachusetts Department of Environmental Protection
- Cape Cod Pond and Lake Atlas
Cape Cod Commission
- Growth Management on Cape Cod: A Survey of Local Bylaws
Association to Preserve Cape Cod
- Cape Cod Priority Ponds Project
The Compact of Cape Cod Conservation Trusts
- Massachusetts Estuaries Project
Massachusetts Department of Environmental Protection and the School of Marine Science Technology, University of Massachusetts Dartmouth

Appendices

- A: Methodology for Assessment and Action Plan
- B: Public Water Supplies
- C: Water Management Act (WMA) Permits
- D: Cape Cod Waterbody Database
- E: Cape Cod Water Reports Database
- F: 1998 303(d) Listed Water bodies
- G: Sources for GIS Data on Subwatershed Fact Sheets and Maps
- H: Glossary of Terms and Acronyms

List of Tables

Table 1. Local Comprehensive Plans for Cape Cod Towns.	8
Table 2. Areas of Critical Environmental Concern on Cape Cod	9
Table 3. Districts of Critical Planning Concern on Cape Cod	10
Table 4. Outstanding Resource Waters on Cape Cod	14
Table 5. Ponds and Lakes Sampled by the Cape Cod Commission for Fish Toxics or the MA Department of Environmental Protection, Division of Watershed Management	22
Table 6. Cape Cod Shellfish Area Classifications as of January 1, 2001	27
Table 7. Certified Vernal Pools by Town	31
Table 8. Cape Cod Population by Town	39

Preamble

Purpose

This document is intended to provide a coordinated approach to the management of natural resources on Cape Cod and to foster environmental protection. Intended users include state, federal, and municipal government, non-governmental organizations, businesses, citizen environmental stewardship groups, and interested citizens. The document was developed under the guidelines of the former Massachusetts Watershed Initiative.

The Cape Cod Watershed Assessment (Chapter 3) presents the current condition of the environment of Cape Cod; identifies studies, planning efforts, and management actions underway that are working towards improving and protecting the area's natural resources; and pinpoints sources and causes of environmental degradation. It gives recommendations to address the environmental problems. The Five Year Watershed Action Plan (Chapter 4) is based on the findings of the watershed assessment, and should guide activities over the next five years and chart a course for watershed research, monitoring, and implementation activities by soliciting funds through grant programs.

Process

The Cape Cod Watershed Assessment and Action Plan were developed through a public process involving collaboration and consensus, with input from state, federal, and local government, non-profit organizations, businesses, environmental stewardship groups, and interested citizens. Data collection for the watershed assessment began in 2000 and continued until Summer 2002. The former Watershed Team compiled information from state agencies, towns, the regional planning agency, environmental non-profit agencies, citizen water quality monitoring groups, and pond and lake associations to provide a picture of the state of the environment on Cape Cod.

The Action Plan was developed during the summer and fall of 2002. The Team formulated the actions contained in the plan through several venues. Many of the actions resulted from discussions at Cape Cod Watershed Team meetings over the past two years. In Summer 2002, a survey was sent to towns, non-profit organizations, and citizen groups Cape-wide to solicit input. Participants at two Cape Cod Watershed Team meetings, held in September and October of 2002 and advertised widely through mailings, contributed additional actions and worked to identify predominant themes among all the actions. An Action Plan Subcommittee was created at these public meetings that subsequently met twice to organize and refine the Action Plan.

For a detailed description of the process of developing the Cape Cod Watershed Assessment and Action Plan, please see Appendix A.

Structure

The first part of this document is the Cape Cod Watershed Assessment. In order to provide both a picture of the whole of the Cape Cod, as well as more detailed information about each of the Cape's 47 embayment subwatersheds, the assessment is comprised of two parts. Section 1 gives an overview of the natural resources and socioeconomic conditions for all of Cape Cod. Section 2 contains a fact sheet and two maps for each subwatershed. The fact sheets list the active citizen or municipal organizations in the subwatershed, studies that have been conducted, water quality monitoring efforts, management actions taken, and priority actions that should be taken to improve or protect the environment.

The second part of this document is the Cape Cod Watershed 5-Year Action Plan. The action plan begins with a listing of goals to protect, restore, and improve the environment of Cape Cod and objectives and strategies that would help meet those goals. From the extensive list of actions that would achieve these goals, objectives, and strategies, the Team chose twelve categories of actions that would benefit from a collaboration of team members. These twelve categories appear in the Action Plan Implementation Matrix. The matrix provides details on the projects, responsible parties, cost, potential funding sources, and measures of success.

Reasoning behind the Structure

The former Cape Cod Watershed Team, in developing this Watershed Assessment and Action Plan, attempted to avoid duplication with other planning programs on the Cape. Cape Cod has a very broad and active environmental community with numerous planning efforts underway. The Cape Cod Commission, the area's Regional Planning Agency, just completed their 2001 Regional Policy Plan. The Commission is also involved in a project to coalesce existing natural resource inventories, plans, and other data sources into a regional open space plan for Cape Cod. Nine of the fifteen towns on Cape Cod have certified Local Comprehensive Plans and several towns are developing Comprehensive Wastewater Management Plans. The Massachusetts Military Reservation, which occupies 22,000 acres on the Upper Cape, is the subject of a massive clean-up effort involving state and federal agencies, local government, and citizen groups working together to assess pollution and direct the clean-up efforts. On the west coast of Cape Cod, Buzzards Bay is the subject of planning efforts by the Buzzards Bay National Estuary Program; on the north coast, Cape Cod Bay is included in the Massachusetts Bays planning program; and on the eastern part of the Cape, the Cape Cod National Seashore has an up-to-date Strategic Plan and Water Resources Management Plan. In addition, several non-governmental organizations, as well as smaller citizen groups, such as lake associations, have developed their own action plans.

In light of the abundance of planning documents prepared by the numerous groups striving to protect and improve the environment of Cape Cod, the Watershed Team decided that the most efficient use of its time would be to develop a plan that focuses on those activities that benefit from a collaboration among various team members. Thus, the Action Plan Implementation Matrix should not be regarded as a comprehensive guidance document listing all potential environmental activities to be undertaken by agencies, non-profit organizations, and citizen groups on Cape Cod. Rather, it is a listing of those activities that

members of the former Cape Cod Watershed Team deemed the highest priority and have agreed to collaborate on during the next five years.

Instructions for State Agency Use

Cape Cod Watershed priorities for grant funding appear in several locations in this document. Priority actions are identified for each of the Cape's 47 subwatersheds. These priorities appear in Section 2 of the Assessment, at the end of each of the subwatershed fact sheets, under the heading "Priorities." Actions of a broader nature, that apply to a larger region or the whole of Cape Cod are provided in the Action Plan, more generally in Section 1: Goals, Objectives, and Strategies, and in more project specific detail in Section 2: Action Plan Implementation Matrix.

Cape Cod Watershed Team Participants

Input into this watershed assessment and action plan was provided by the members and participants of the former Cape Cod Watershed Team.

Members:

Department of Environmental Protection – Elizabeth Kouloheras
Department of Environmental Management – Christine Gault, Les Perry
Department of Fish and Game – Amy Singler, Steve Hurley
Division of Marine Fisheries – Paul Caruso
Coastal Zone Management – Truman Henson, Katie Lund
Office of Technical Assistance – Matt McCook
U.S. Environmental Protection Agency – Bruce Rosinoff
U.S.D.A. Natural Resources and Conservation Service – Don Liptack
Cape Cod National Seashore, National Park Service
Cape Cod Commission – Tom Cambareri, Ed Eichner
Barnstable County Coastal Resources Committee – Robert Duncanson
Orleans Water Quality Task Force – Judy Scanlon
Community Foundation of Cape Cod – Lisa McNeil
Association to Preserve Cape Cod – Maggie Geist
The Compact of Cape Cod Conservation Trusts – Mark Robinson

Participants:

Citizen Water Quality Monitoring Network
Pleasant Bay Alliance
Mashpee Environmental Coalition
Long Pond Association
Cotuit Waders
Three Bays Preservation
Bourne Water Pollution Task Force
Town of Barnstable
Town of Mashpee
Dennis Water Quality Advisory Board
Chatham Water Quality Lab

Harwich Water Quality Task Force
Barnstable County Resource Development Office
Orenda Wildlife Land Trust
Cape Cod Conservation District
Cape Cod Community College
Massachusetts Bays Program
Barnstable County Health Department
The Nature Conservancy
Massachusetts Audubon Society – Wellfleet Bay Wildlife Sanctuary
Coalition For Buzzards Bay
Cape & Islands Senior Environment Corps
Woods Hole Oceanographic Institute Sea Grant
United States Geological Survey
Massachusetts Wetlands Restoration Program
Town of Wellfleet
Town of Eastham
Indian Ponds Association
Brewster Ponds Stewards
And Many Interested Citizens

Photo Credits

Photographs that appear in the assessment were supplied in 2001 by the Massachusetts Executive Office of Environmental Affairs Community Preservation Initiative staff.